



TWIN-HEADED TOOTHBRUSH

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BACKGROUND

As disclosed in U.S. Pat. Nos. 5,121,520 and 5,499,421 issued to the present inventor, Michael Brice, the disclosures of which are incorporated herein by reference, to effectively clean teeth and gum areas complex maneuvering of a toothbrush is necessary. It is generally acknowledged that the great majority of individuals brush their teeth and gum surfaces primarily in a horizontal and semi-circular manner, even though this particular technique is not deemed to be the best way of cleaning the teeth and gum surfaces. There are two reasons why most individuals resort to this ineffective technique. First, conventional brushing heads are not particularly designed to follow the contours of the teeth and gum surfaces, and as an extension of the human arm do not permit complicated and exact maneuvers to be performed. Second, most brushing takes place in the early morning when one first arises and in the evening just prior to retiring. This is a key factor, as demanding complicated procedures for this time of day and night are beyond the tolerance of most individuals. For these reasons, most individuals resort to a simple natural horizontal or semi-circular conventional brushing technique.

Numerous attempts have been made in the past as shown, for example, in U.S. Pat. Nos. 860,840 to Strassburger, 3,742,549 to Scopp et al., and 4,67,360 to Marthaler et al. To improve the design of the toothbrush. The bristles and/or head of these prior inventions are angled relative to the handle portion. More particularly, U.S. Pat. No. 860,840 to Strassburger discloses a toothbrush having two rows of bristles which are sloped in opposite directions relative to each other and a central section of bristles arranged parallel and located

between the two outside rows. However, these prior inventions do not simultaneously and/or independently accommodate different contours of the teeth.

In other prior art patents, adjacent head portions of a toothbrush are made to pivot or flex relative to the handle portion so that the bristles are better able to conform to the contours of the teeth and gum surfaces. Such an arrangement is shown in U.S. Pat. Nos. 1,928,328 to Carpentier, 2,266,195 to Hallock, 3,152,349 to Brennesholtz, 4,333,199 to Del Rosario, 4,488,328 to Hyman, 4,691,405 to Reed, and 4,776,054 to Rauch. More particularly, U.S. Pat. Nos. 4,333,199 to Del Rosario and 4,488,328 to Hyman disclose a toothbrush having a single discreet brushing head that can be pivoted about the handle. The Del Rosario patent, in addition, discloses a brushing head that can rotate about three planes.

U.S. Pat. Nos. 1,928,328 to Carpentier, 2,266,195 to Hallock, 3,152,349 to Brennesholtz and 4,691,405 to Reed show a toothbrush head capable of flexing or articulating relative to the handle. Specifically, the brushing head comprises a plurality of serially arranged flexing head segments, wherein the segments flex in unison or relative to each other.

Finally, U.S. Pat. No. 4,776,054 to Rauch discloses a toothbrush head having three arranged brushing segments, whereby the central segment is aligned with the handle and the two segments on either side are symmetrically arranged relative to the central segment. The bristles on the outer sides of the Rauch patent have narrow, blade-like, contact points which are likely to induce excessive pressure to the gum due to the narrow contact points. In other words, the narrow blade-like bristles inherently place higher excessive concentrated pressure

on the gum more so than bristles with a larger contact area which can spread pressure evenly to the larger contact area.

None of the prior art toothbrushes are directed to overcoming ineffective brushing techniques. These prior inventions do not disclose a toothbrush that overcomes the individual's anatomically limited abilities to effectively clean the curvilinear surfaces of the teeth and provide for gentle stimulation of the varying gum tissues without harm or discomfort for the user by utilizing side-by-side arranged brushing heads.

In addition, none of these prior art toothbrushes provide for the discreet functioning of twin-brushing heads as separate elements in achieving the object of this invention through addressing the force exerted by the user (The X Value), the resistance/resiliency characteristics of the molecular density of the material used in conjunction with the structural dimensions of the device (The Y Value), in concert with the resistance/resiliency of the bristle body as separate functioning elements of the uniform bristle body mass (The Z Value).

Moreover, none of the prior art toothbrushes enables the varying of the brushing pressure, in accordance with the proclivity of the user, in order to prevent excessive pressure from being applied to the gums and/or gingival tissue or from injury to the tooth enamel.

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SUMMARY OF THE INVENTION

Accordingly, one object of the present invention is to achieve proper functioning of the twin-brushing heads to function in such a manner as to provide alternate addressing and penetration of the dento-gingival junction of the tooth/teeth/gum structures (the gingival margin) so as to respond independently with the inside and adjacent rows of bristles of each head in maintaining contact and orientation to such gingival-margin areas of each individual during brushing.

Accordingly, one object of the present invention is to provide an improved cleaning instrument for cleaning teeth and gingival tissue that enables a user to achieve correct tooth brushing pressure.

Another object of the invention is to provide a toothbrush whose twin-heads respond to the pressure exerted by the user to enable effective tooth/gingival tissue cleaning, without tooth or gingival damage.

Still another object of the invention is to coordinate the brushing force of a user (the X Value) with the structural dimensions and the molecular density of the materials of the twin-brushing heads of the device (the Y Value), in conjunction and concert with the twin discreet and combined bristle body mass offering resistance and resiliency characteristics (the Z Value).

The above-identified objects and features and advantages of the invention will be better appreciated and understood from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a top view of the left and right side handles of a toothbrush;

Figs. 1A and 1B show the insert of Figs. 1-3;

Fig. 2 shows a side view of the left and right side handles in which the handles are slightly turned to enable a partial view of the top of the left and right side handles of a toothbrush;

Fig. 3 shows a top view similar to Fig. 1 but wherein the gap of Fig. 1 has been significantly reduced and the left and right side handles are shown in close proximity to illustrate that except for the neck and brush head portions, each of the left and right handles are straight and parallel to each other.

Fig. 4 shows a bottom view of a brush, with the left and right handles being slightly separated;

Fig. 5 shows a top view of the brush with slightly separated left and right handles.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The embodiments described herein have been included for purposes of illustrating the principals of the present invention. Accordingly, the present invention is not limited to the exact configurations and constructions as illustrated and/or set forth herein.

Also, throughout the illustrations of different embodiments of the invention, the same or equivalent elements have been identified with the same reference numerals.

Figs. 1-3 show a first embodiment of the left (L) and right (R) handles of a dual headed toothbrush (10) of the present invention. Conventional molding equipment is used to form the integral right handle (R) and integral left handle (L). The right and left handles of the invention, consisting of handles 12L and 12R, the neck portions 13L and 13R and the brushing head 14L and 14R, are molded from polymers of amorphoric resins or

semicrystalline resins. Thereafter the heads are held flat and holes for the brushes are drilled and bristles 15 plugged into the holes. The bristles have a certain stiffness which can range from soft to hard to vary the resiliency and resistance presented by the bristles to the teeth and gums during the brushing operation. The bristles are cut to any desired length, shape or profile, and then polished in accordance with commercially known techniques.

The left and right handles are then brought together and welded along the handle 12L and 12R by conventional bonding and welding techniques. For example, the Branson Ultrasonic Corporation, manufactures and sells commercial vibrational and ultrasonic welding machines capable of welding various types of plastics.

This invention is dependent upon understanding and addressing the force exerted by the user in brushing his or her teeth (the X Value), meeting the resistance, resiliency characteristics of the molecular density of the material used in conjunction with the structural dimensions of the twin-brushing elements (the Y Value) achieving alternate functioning of the twin-brushing heads in concert with the resistance/resiliency characteristics of the discreet and combined uniform bristle body mass (the Z Value) in maintaining contact with the dento-gingival junction with the inside and adjacent rows of bristles of each independently articulating twin-brushing heads. Addressing each of these factors (values), and the elements for carrying out each of these factors, provides for the proper functioning characteristics of the invention/device in use.

The invention can be analogized to a machine whose moving parts are activated by a power source, e.g. the user. The description which follows sets forth, addresses and describes the elements needed to achieve proper functioning of the invention/device.

The invention/device is wholly dependent on characteristics of necks 13L and 13R, and brush heads 14L and 14R to achieve the proper functioning in use, of the device. Moreover, the brush can work (function) equally well with or without the use of a cushioned insert 16 in the handle. The cushioned insert is shown in the embodiment of Figs. 1-3. The embodiments of Figs.4 and 5 illustrate the invention without the use of a cushioned insert 16.

The inclusion of the “cushioned” insert, which can be made of a rubber having a stiffness which varies from soft to hard can increase the sensitivity for the user. The increase in sensitivity occurs as a result of the pressure transmitted by the user through the thumb being totally or partially absorbed by said insert. The insert can be of any shape or design which fits into a similarly shaped cavity provided in the L & R handles. The insert 16 of Fig. 1 is shown to have an oval top. (See Fig. 1A) Moreover, the oval shaped insert 16 is provided with a rectangular base 16B. The rectangular base 16B slides into a rectangular cavity 16C formed during the molding operation of the left and right handles. Thus, while separated the insert is slide into cavity 16C. A suitable adhesive may be used to hold the rectangular base 16A of insert 16 in cavity 16C of the handles. Thereafter the bonding of the left an right handles will insure the permanent retention of insert 16 in the finished toothbrush. Also, the insert is made of rubber and shaped to accommodate the thumb of the user. The resiliency characteristics of the rubber can be varied to accommodate the pressure exerted on the brush through the thumb of the user. Thus the stiffness of the rubber insert can be varied from soft to hard to provide a range of cushioning characteristics.

Further, the polymers used to make left and right handles can be selected to increase or decrease the flexibility, resiliency and resistance of the necks 13L and 13R of the left and right handles. Similarly, the stiffness of the bristles 5 of the brushing heads 14L and 14R can be selected to range from soft to hard to vary the resiliency and resistance presented by the bristle to the teeth and gum of the user.

The present invention provides for the adaptation of brushing pressure to the changing surfaces of the differing tooth/teeth/gingival structures of the user encountered during brushing by the twin, self-responding self articulating brushing head of this invention. Fully addressing and understanding the previously described X, Y and Z Values allow for the full, proper and safe functioning of said device with the clear objective of accomplishing the orientation to the critical gingival-margin areas of each individual's particular tooth/teeth/gingival structures by the inside and adjacent rows of each brushing head.

The foregoing description is only illustrative of the principle of my invention. It is to be recognized and understood that the invention is not limited to the exact configurations as illustrated and described herein. Accordingly, all expedient modifications can be made within the scope and spirit of the invention.